

Silicon Carbide Grid Supports for X-ray Telescopes, Phase I

Completed Technology Project (2018 - 2019)



Project Introduction

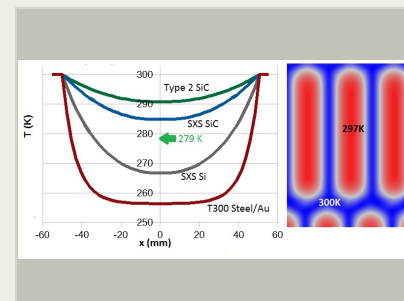
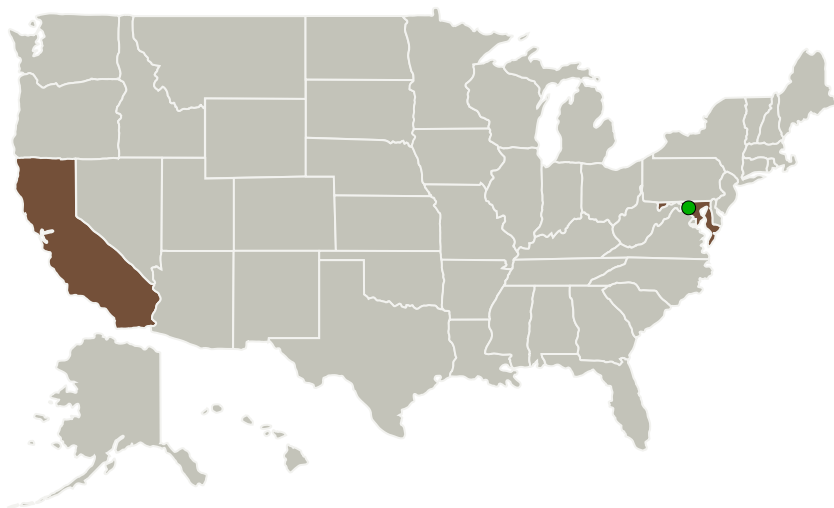
PhotonFoil will develop single-crystal silicon carbide grid supports for large-area X-ray microcalorimeter entrance filters. Compared with existing silicon grids, the PhotonFoil silicon carbide grids will have >3X higher thermal conductance and higher strength. EMI shielding of 20dB per grid at 1GHz for 100mm apertures can be incorporated. Higher soft X-ray transmittance than achieved with Hitomi SXS filters appears feasible.

Anticipated Benefits

X-ray Surveyor, Micro-X, GOES satellite X-ray imagers, atmospheric test windows with low extraneous signal, X-ray windows for solar imaging, CCD optical blocking filters with low contaminant accumulation, neutral atom detector support grids, electron detection support grids

NIST microcalorimeters, large area X-ray windows for laboratory detectors, high harmonic generation (HHG) bandpass and order selection filters, free electron laser beam components, fourth generation synchrotron beamline components, beryllium replacement windows providing higher elemental detectivity, support grids for proton stripping foils

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
PhotonFoil	Lead Organization	Industry	Ventura, California
● Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations

California	Maryland
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Project Transitions

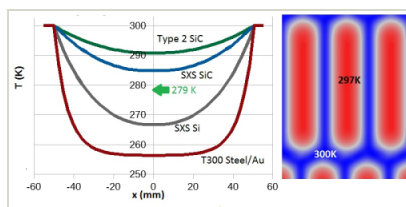
▶ **July 2018:** Project Start

✓ **February 2019:** Closed out

Closeout Documentation:

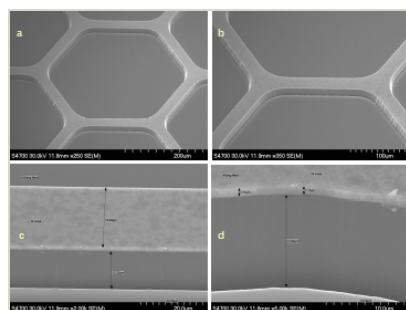
- Final Summary Chart(<https://techport.nasa.gov/file/141293>)

Images



Briefing Chart Image

Silicon Carbide Grid Supports for X-ray Telescopes, Phase I
(<https://techport.nasa.gov/image/130205>)



Final Summary Chart Image

Silicon Carbide Grid Supports for X-ray Telescopes, Phase I
(<https://techport.nasa.gov/image/131915>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

PhotonFoil

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Bruce M Lairson

Co-Investigator:

Bruce Lairson

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Technology Maturity (TRL)

Start: 2
Current: 4
Estimated End: 4



Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.1 Remote Sensing Instruments/Sensors
 - └ TX08.1.1 Detectors and Focal Planes

Target Destination

Earth